# Modular Construction in Education

Case Study **Of Lynn Fripps Elementary**
By Group Study Architecture (GSA) +
Creo Construction Ltd.

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# What is Modular Construction?

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# **Modular:** What is it?

- Built from smaller units - **“modules”**
- Types: **Volumetric and Pre-fabricated panels**
- **Factory-fabricated** off-site using standard dimensions
- Each module includes: **Structure, Services,** and **Finishes**

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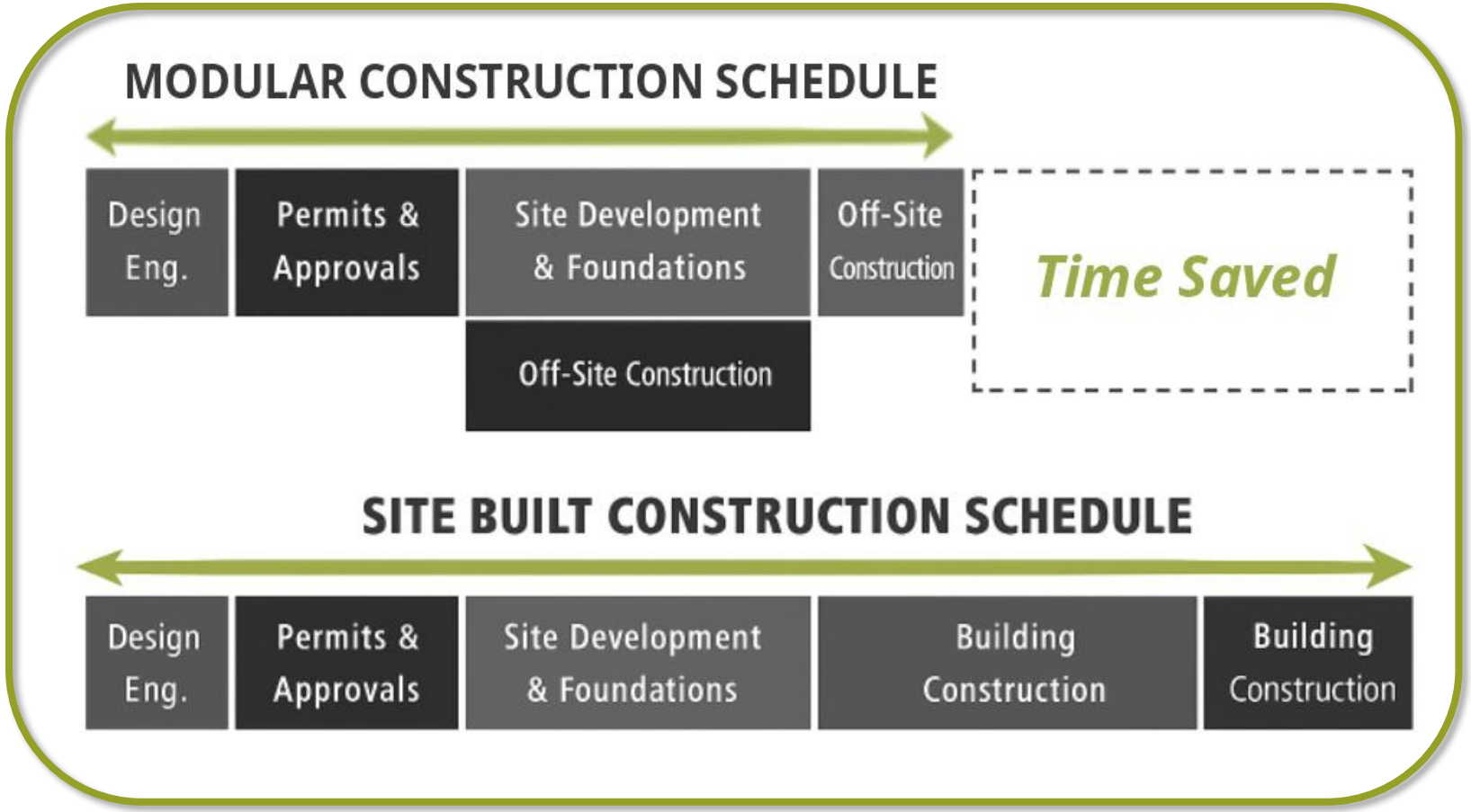
# **Modular:** Why Modular?

**Time Savings:**

- Up to 30% faster project timeline
- Off-site construction minimizes operation disruptions

**Safety:**

- Reduces on-site activity
- Minimizes safety risks for occupants and workers

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# **Modular:** Why Modular?

**Reduced Labour**

- Increased efficiency

**Waste Reduction**

- Promotes recycling and sustainable practices

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# **Modular:** Pros vs Cons

| Pros | Cons |
| --- | --- |
| Same durability as traditional construction | Limited sizes due to transportation constraints |
| Ideal for fast-track projects | Accurate dimension verification required for proper site alignment |
| Weather independent production | Deposit required before finished product arrives at site |
| Protected off-site environment prevents mold issues | |
| Faster, more predictable schedules | |

# Procurement & Design Process

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# Process Overview

- Project Initiation and Leadership
- Timeline and Deliverables
- Coordination and Communication
- Capacity and Disruption Goals
- Integration with Academic Schedule

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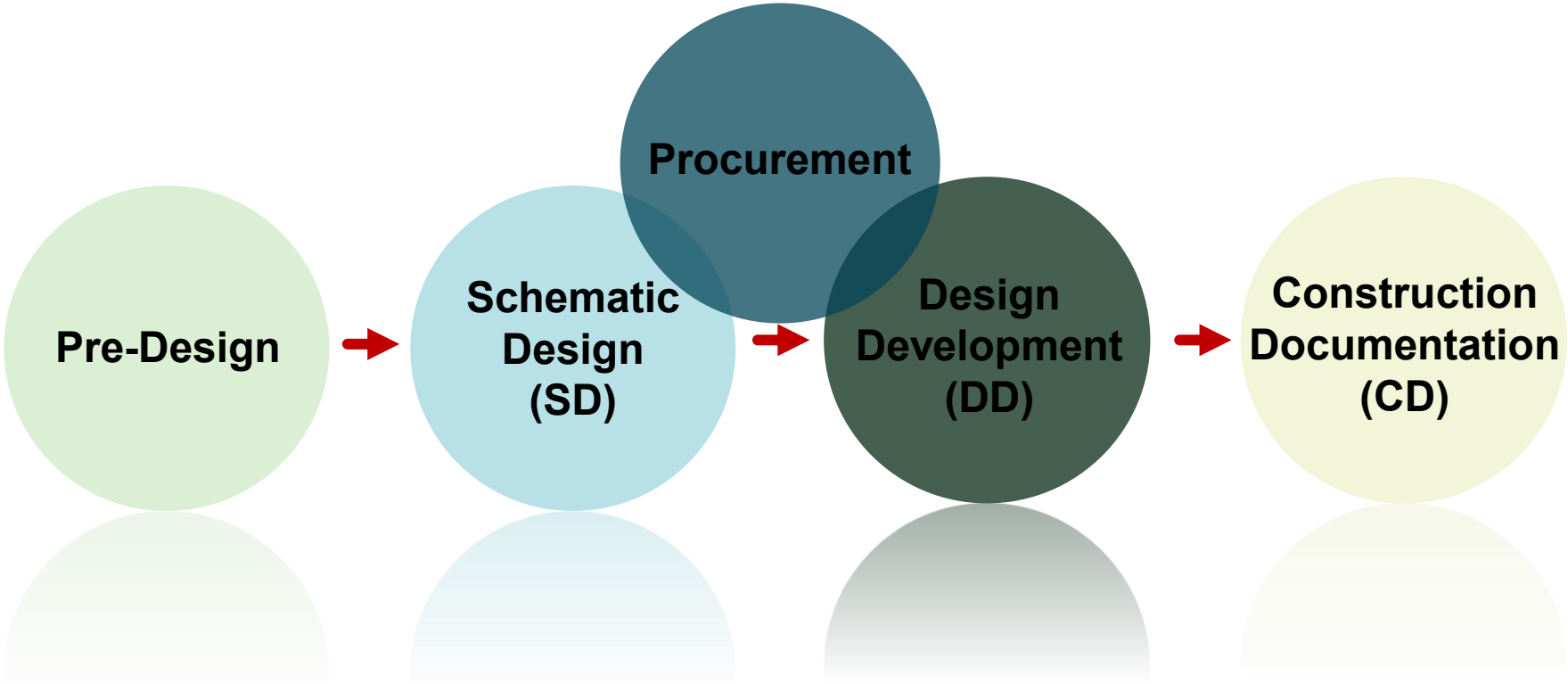
# Project Phases



# Pre-Design Coordination



Site Assessment

AHJ

Utility Integration

Construction Phasing

Schedule Coordination

# **Schematic Design** | Site Conditions

SD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# **Schematic Design** | Site Conditions

SD


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# **Schematic Design** | Site Conditions

SD

**Existing South Exit Staircase**

**Key Plan**

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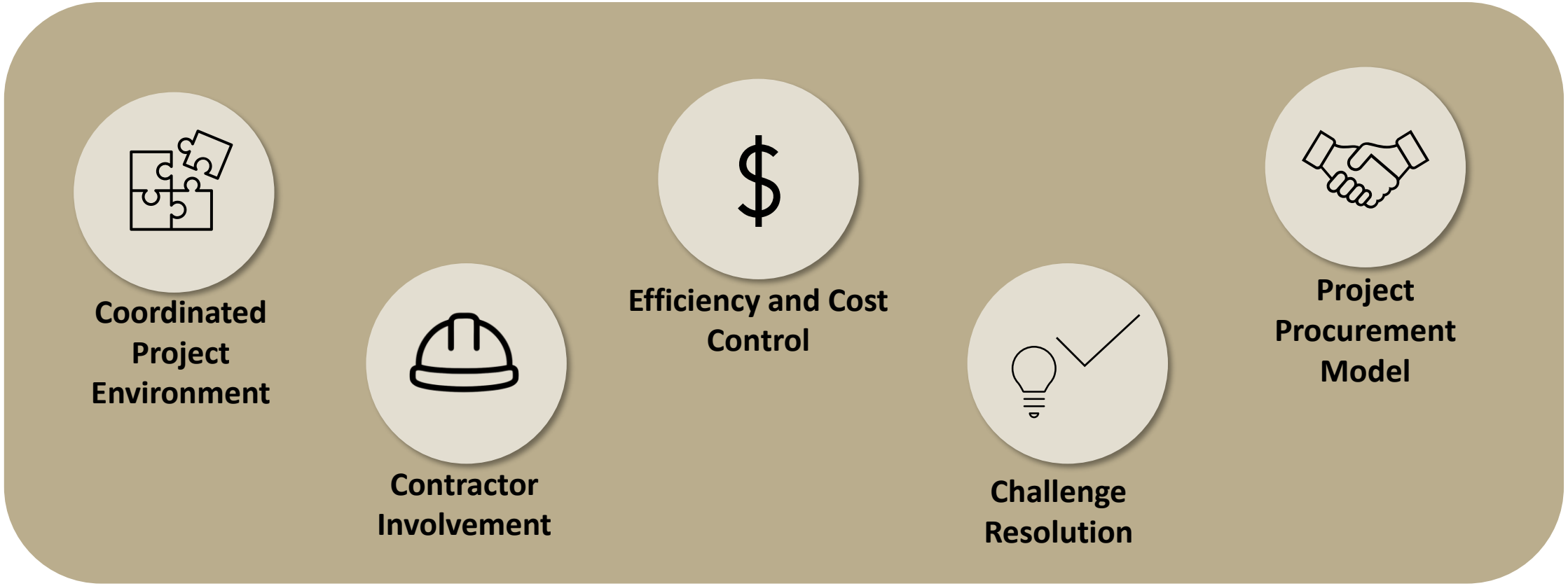
# Procurement



# **Design Development** | Initial Renders

DD

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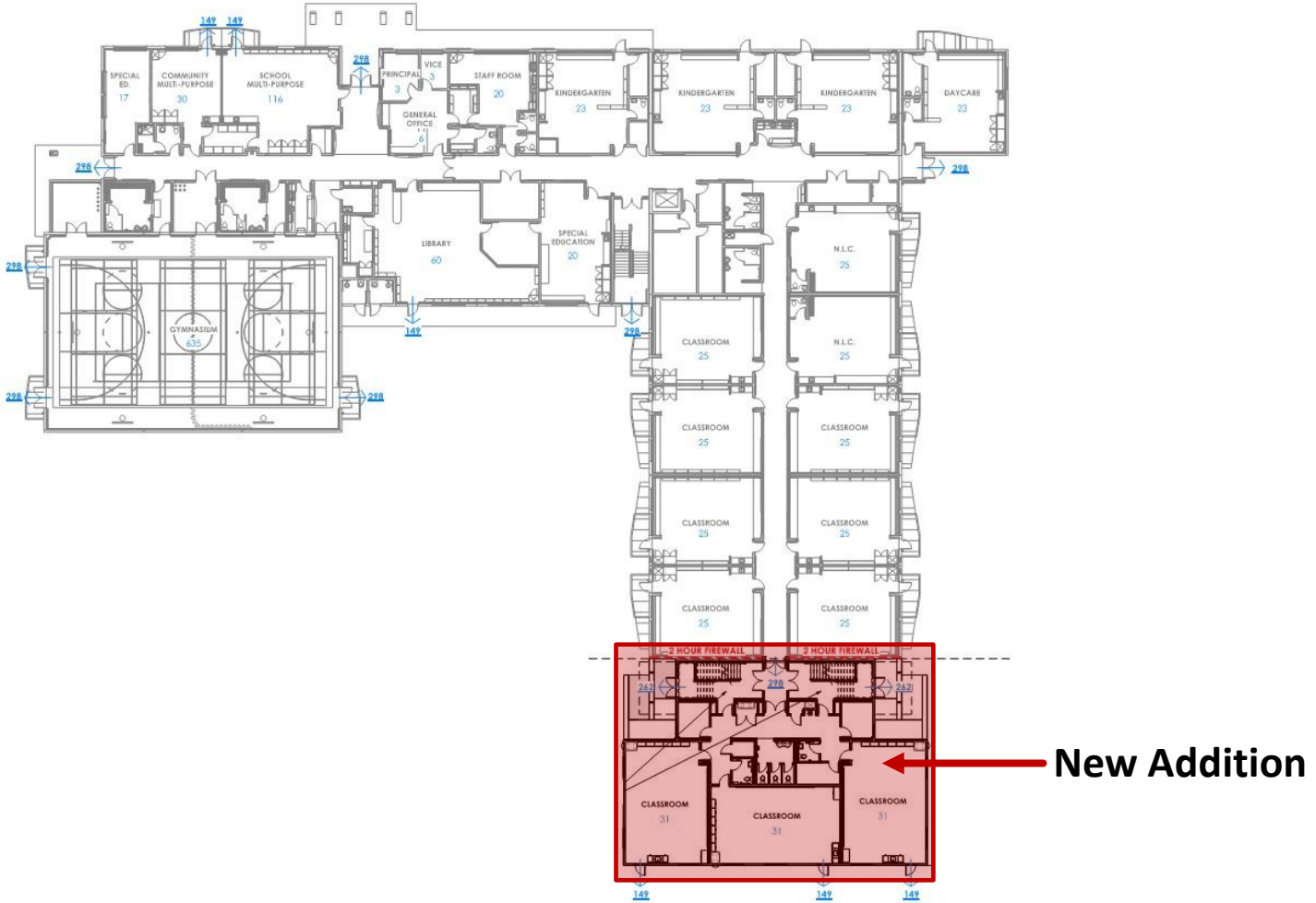
# Design Development | Plan

DD

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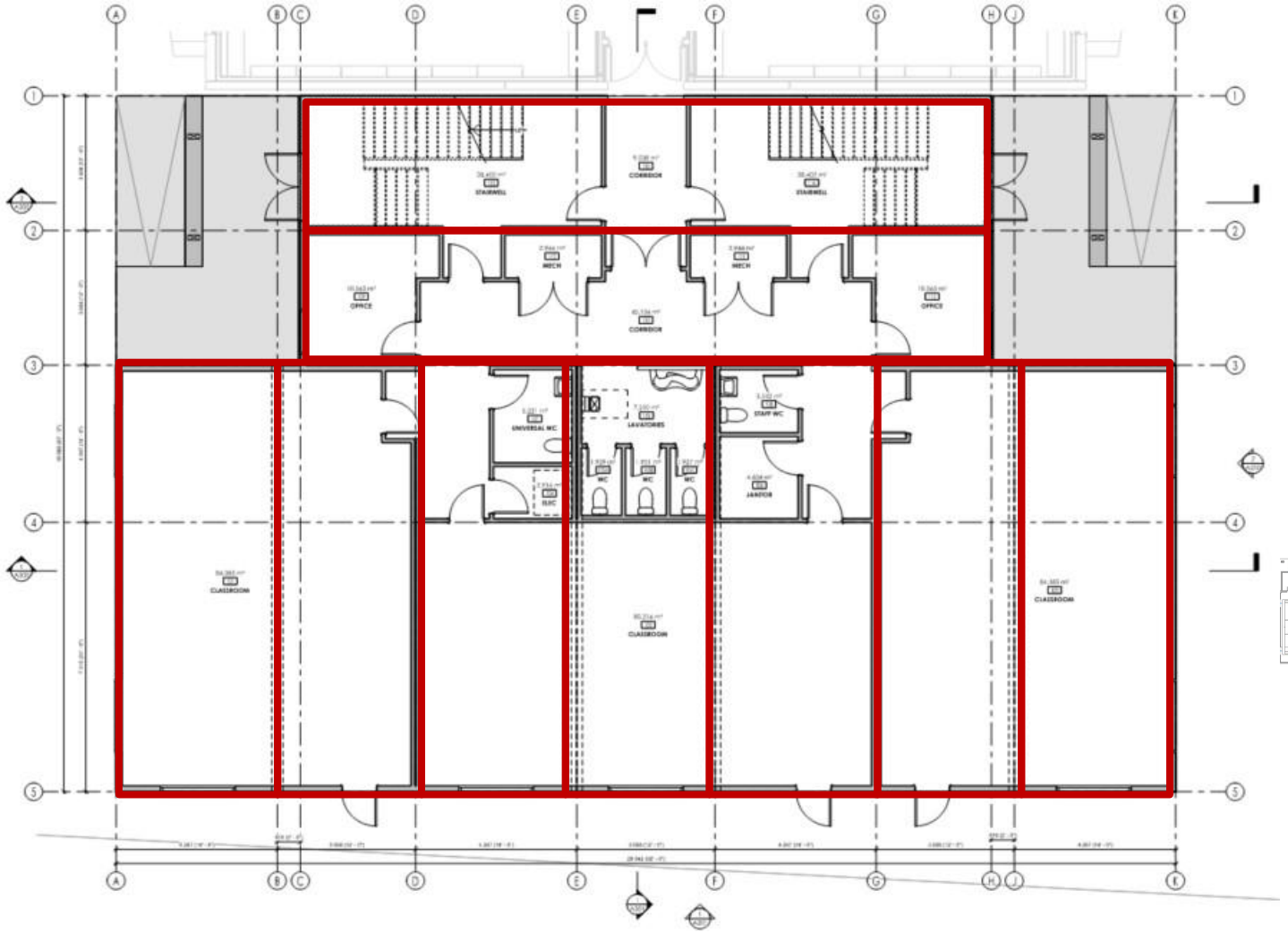
# **Design Development** | Modular Sections

DD



Key Plan

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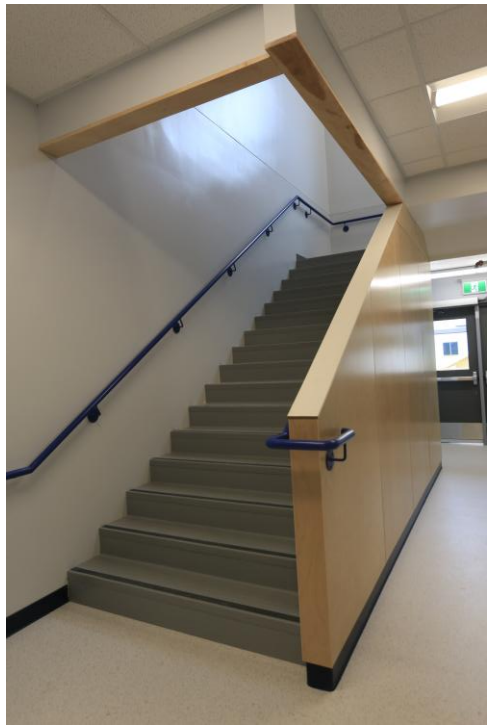
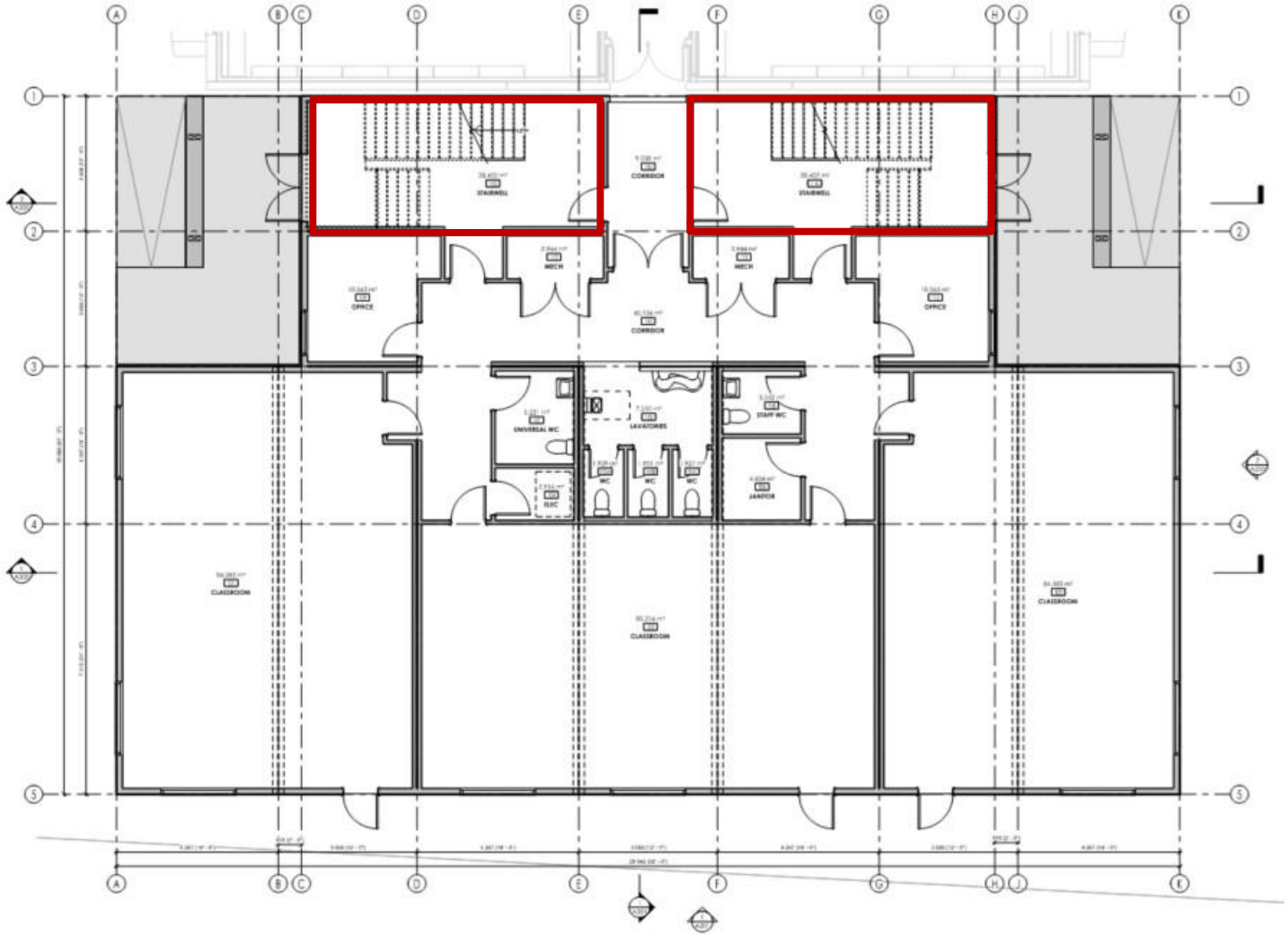
# **Design Development** | Vertical Circulation

DD



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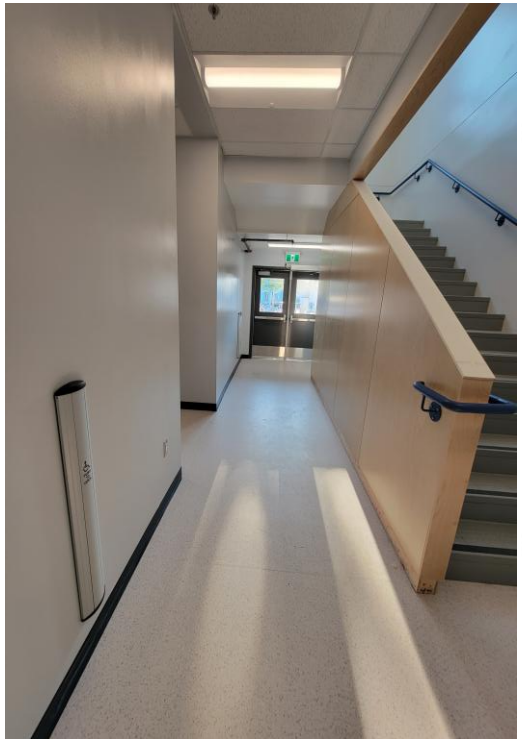
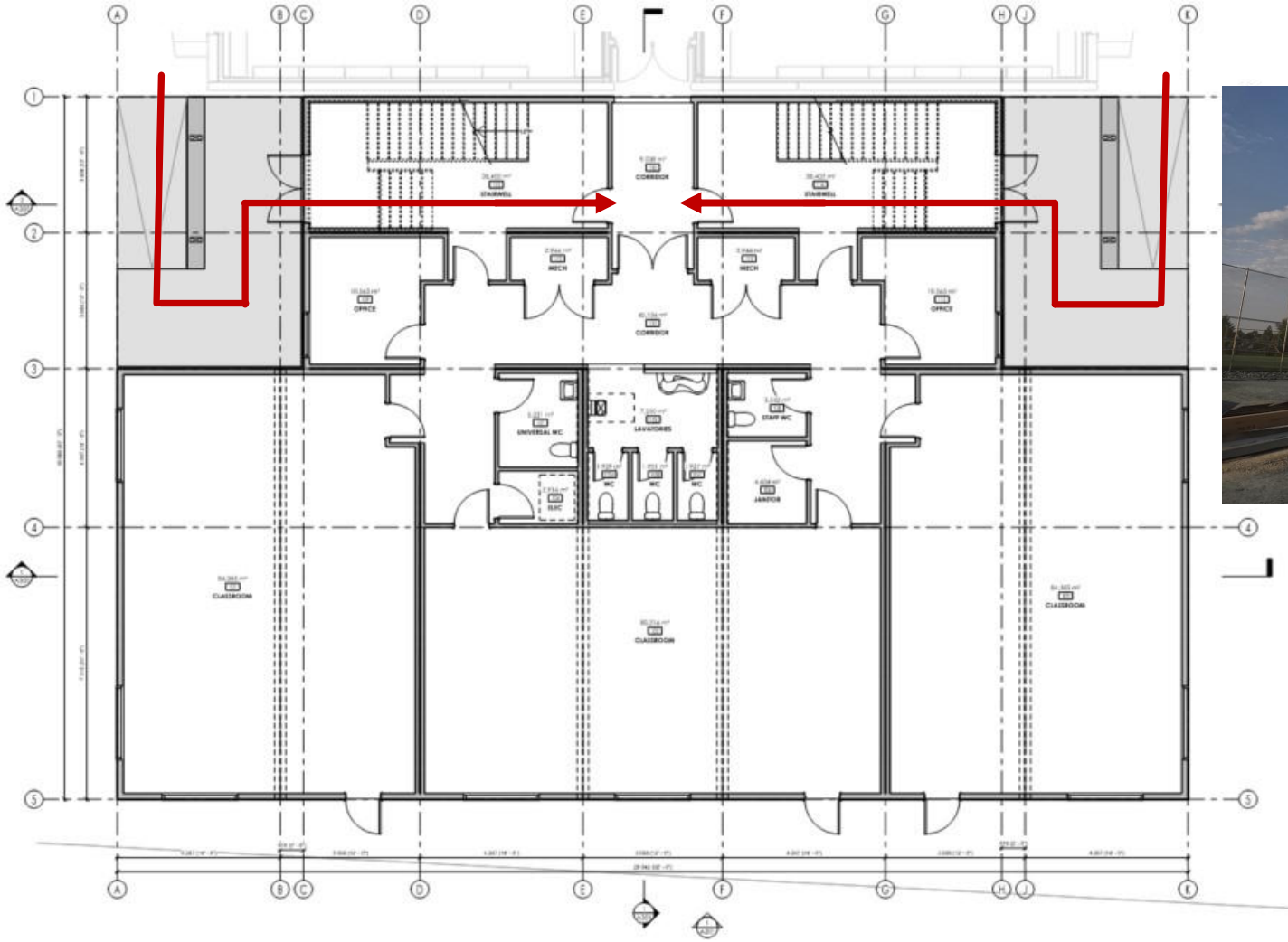
# **Design Development** | Entrances

DD





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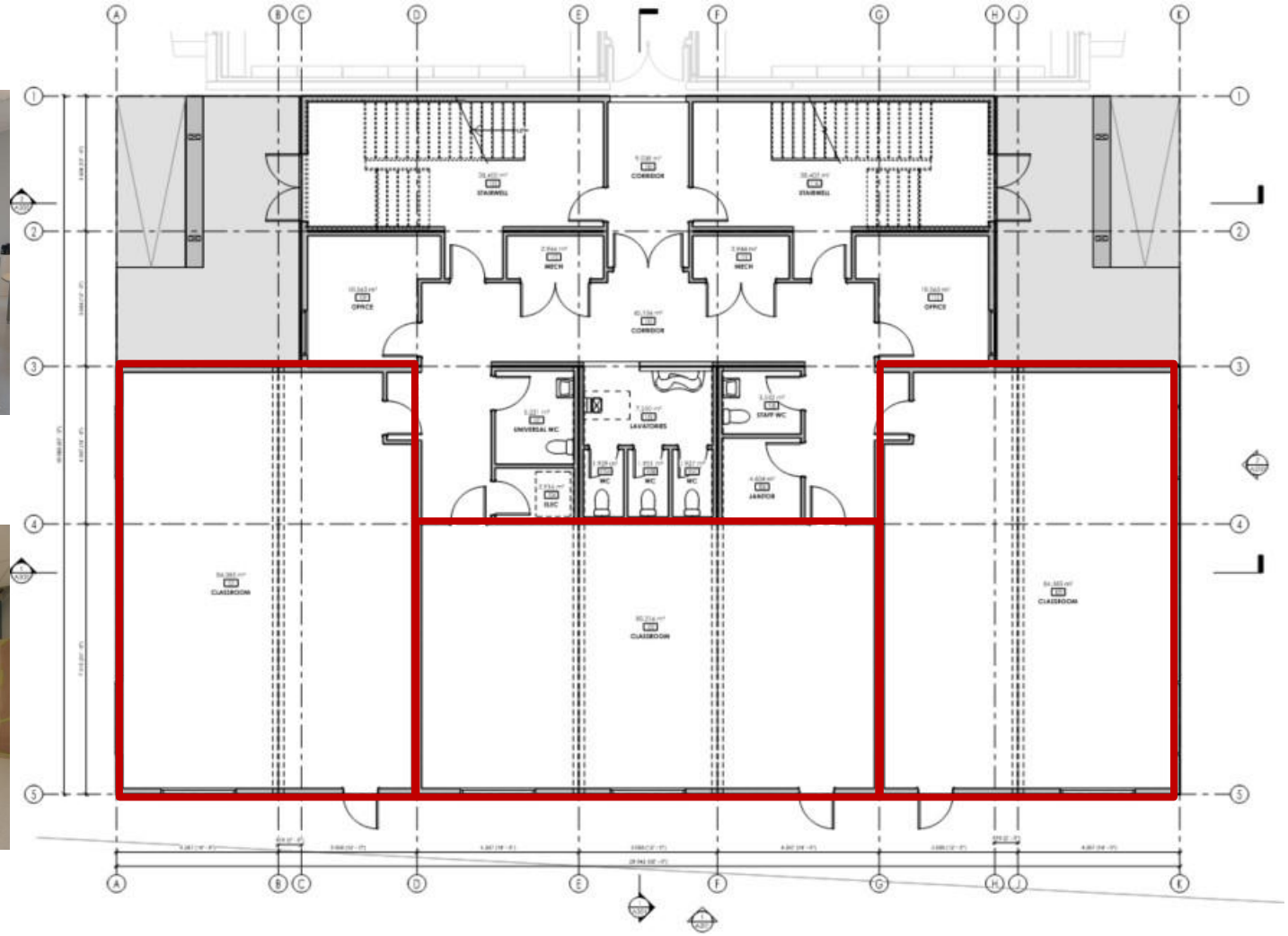
# **Design Development** | Classrooms

DD



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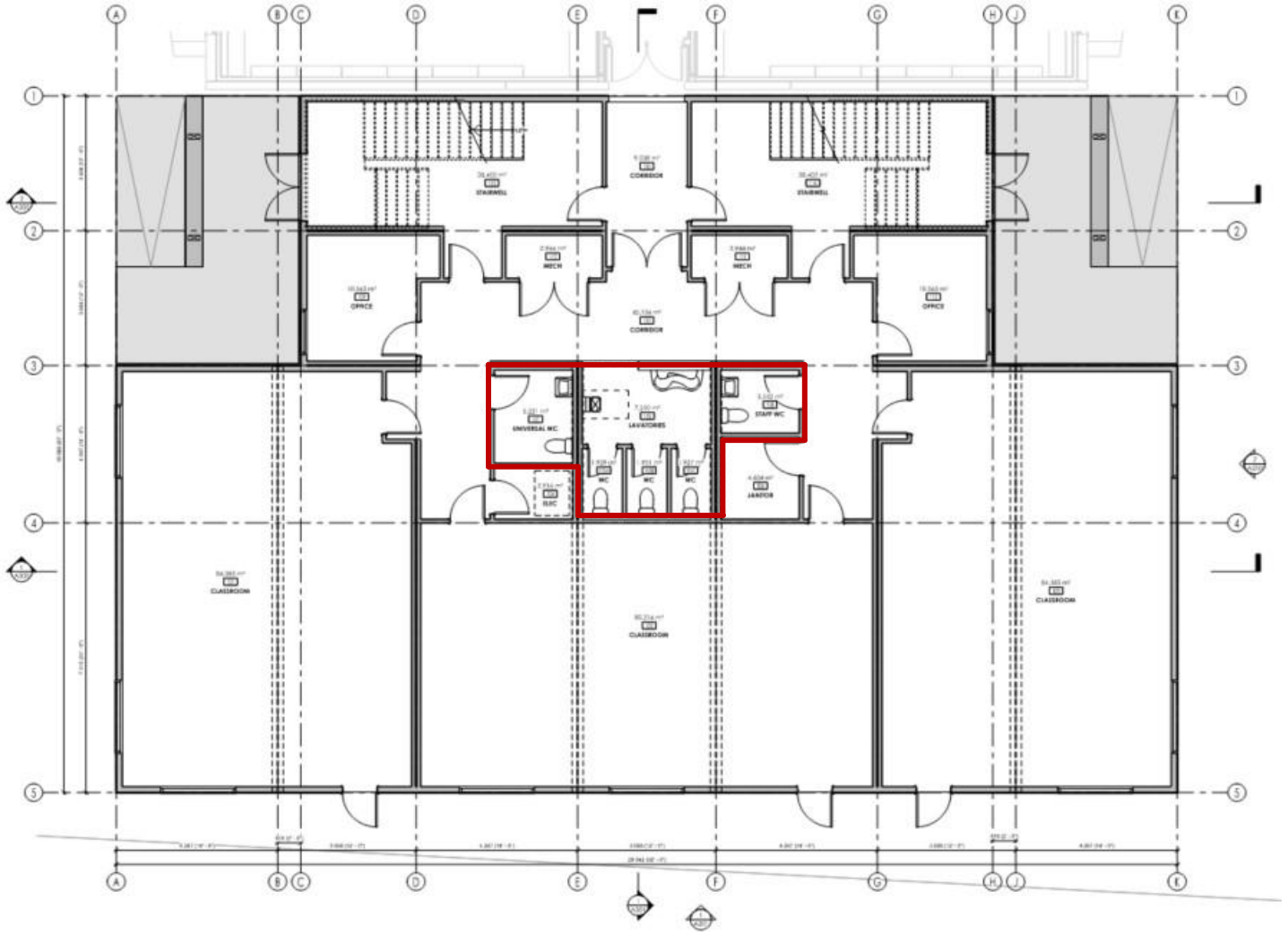
# **Design Development** | Washrooms

DD

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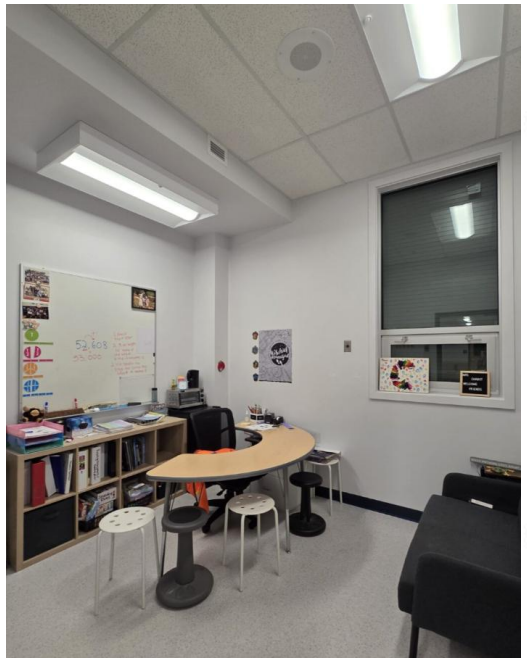
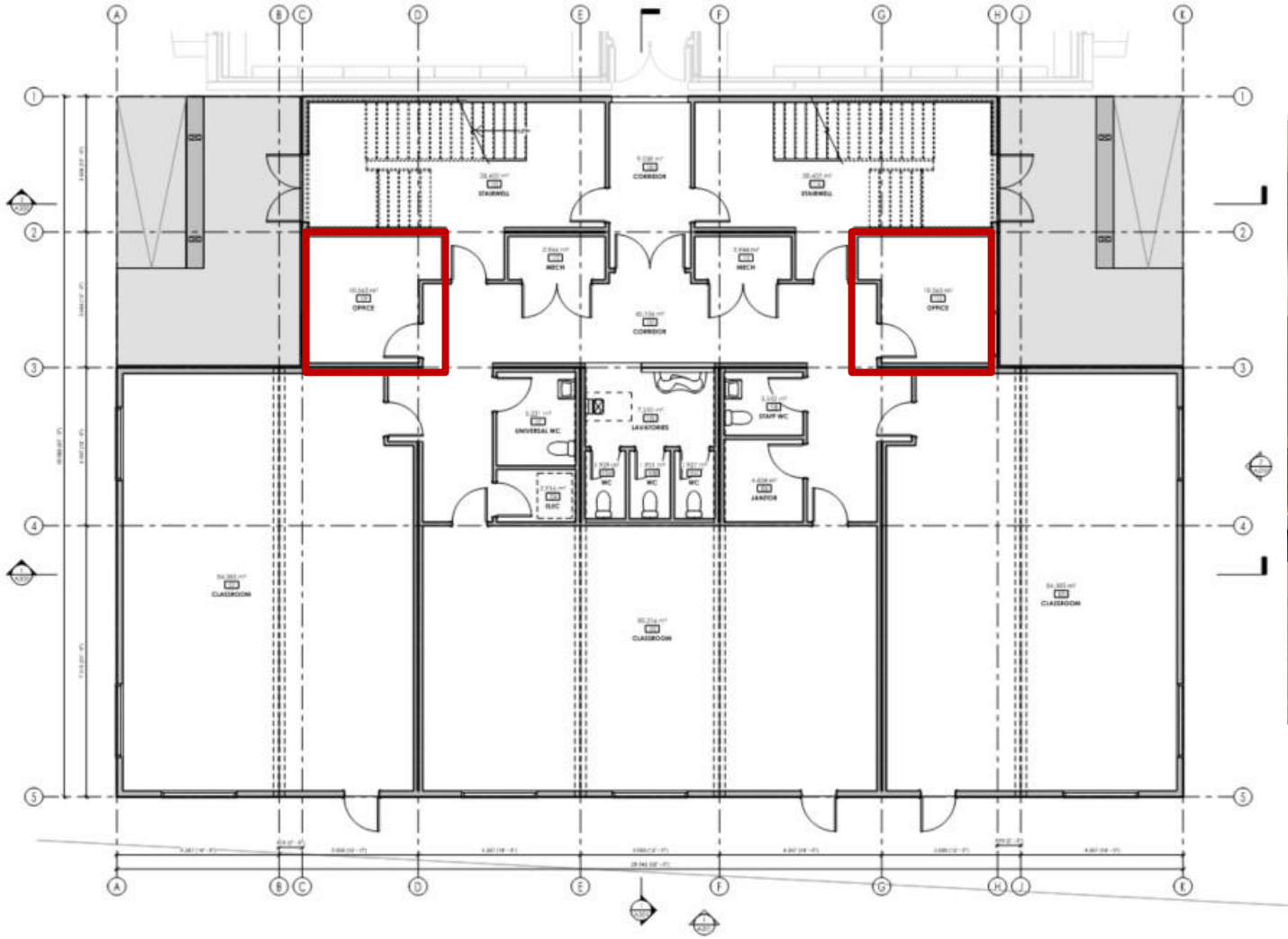
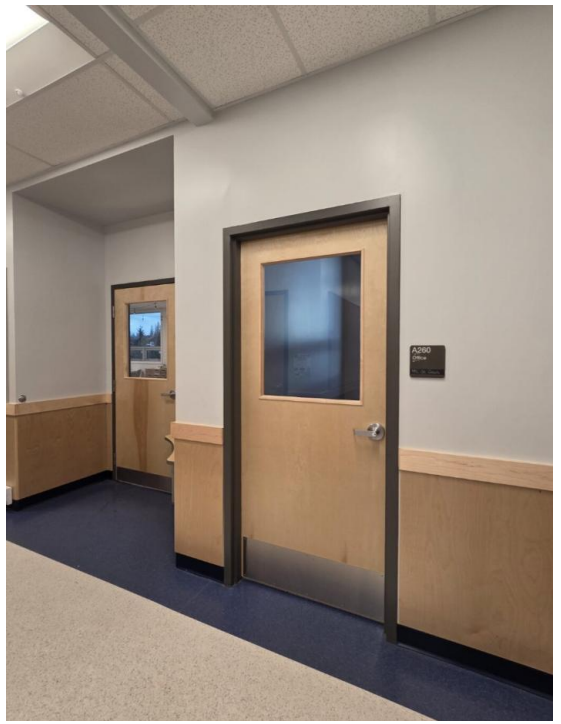
# **Design Development** | Offices

DD







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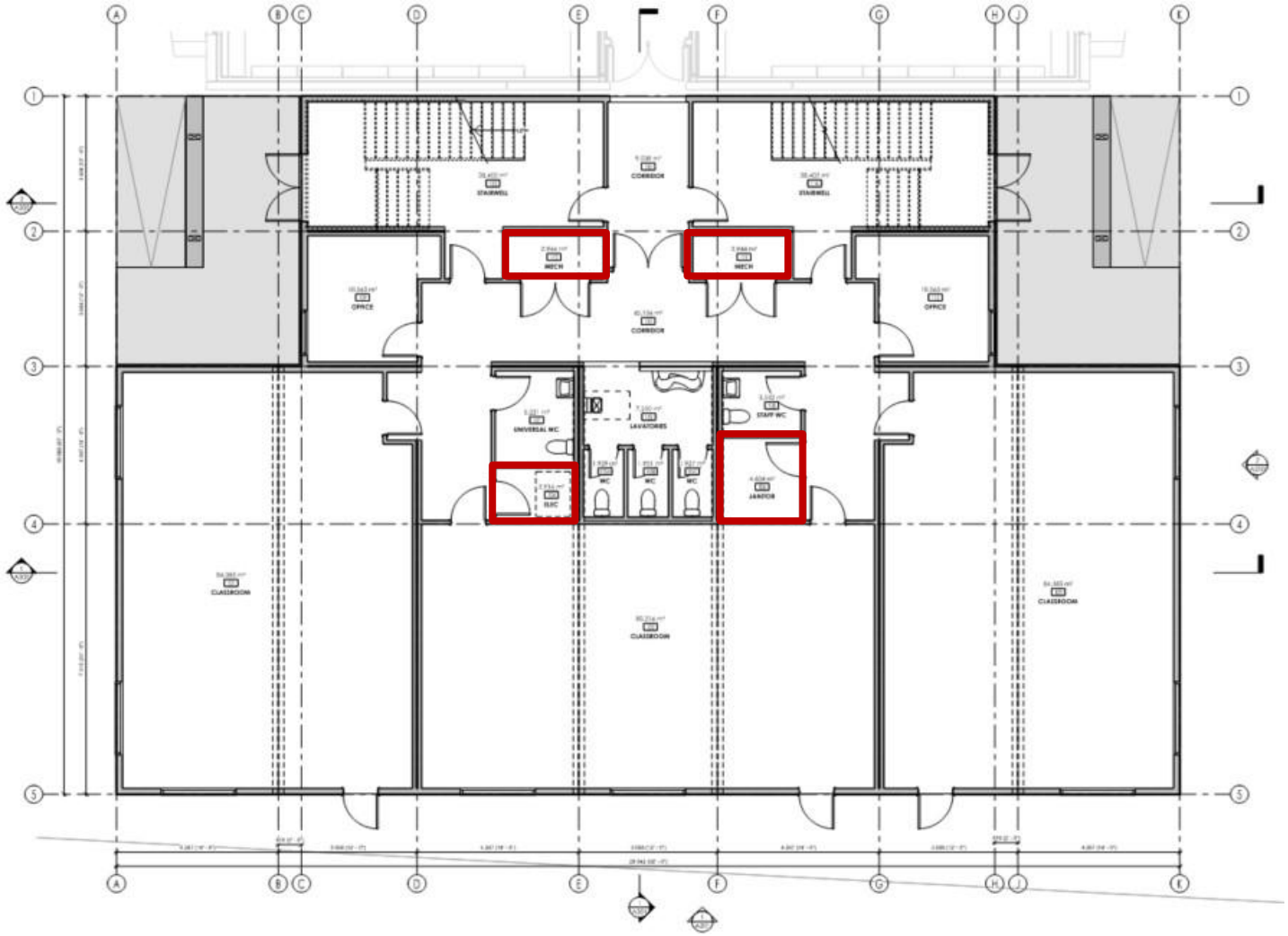
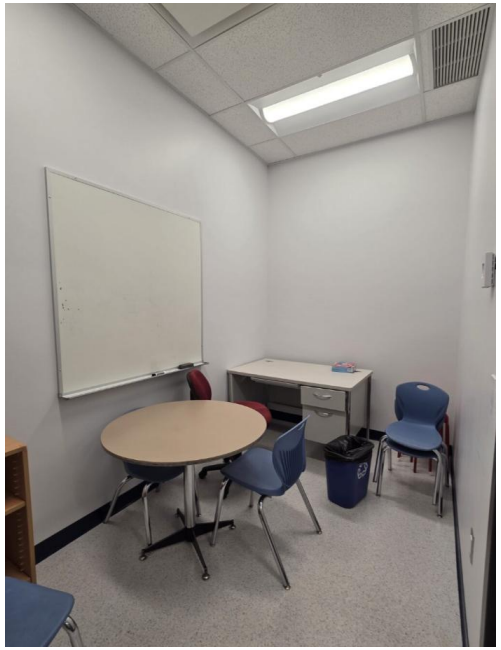
# **Design Development** | Services

DD





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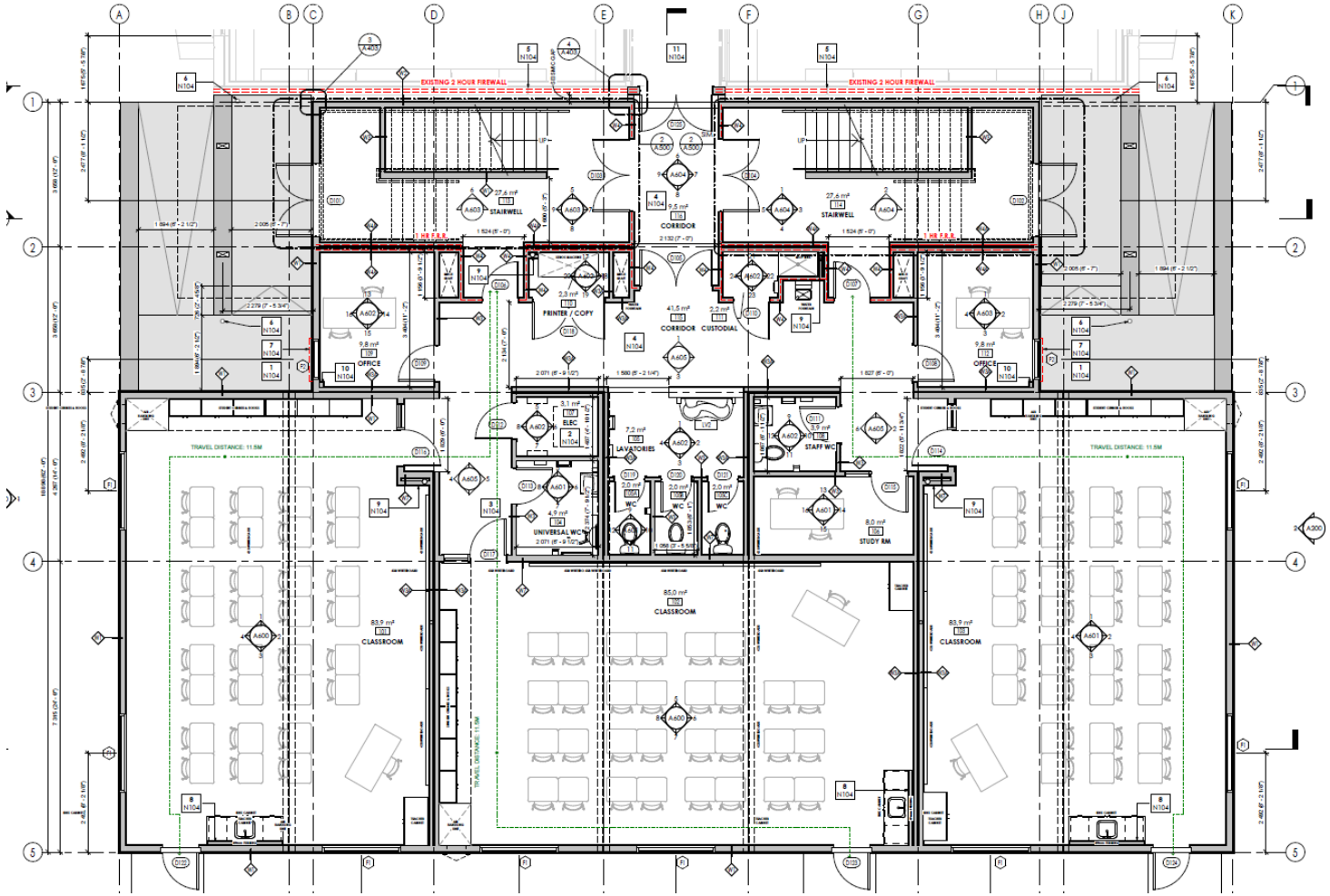
# Construction Documents

CD

- Design is complete at this stage
- Focus on efficiency and accuracy for construction phase

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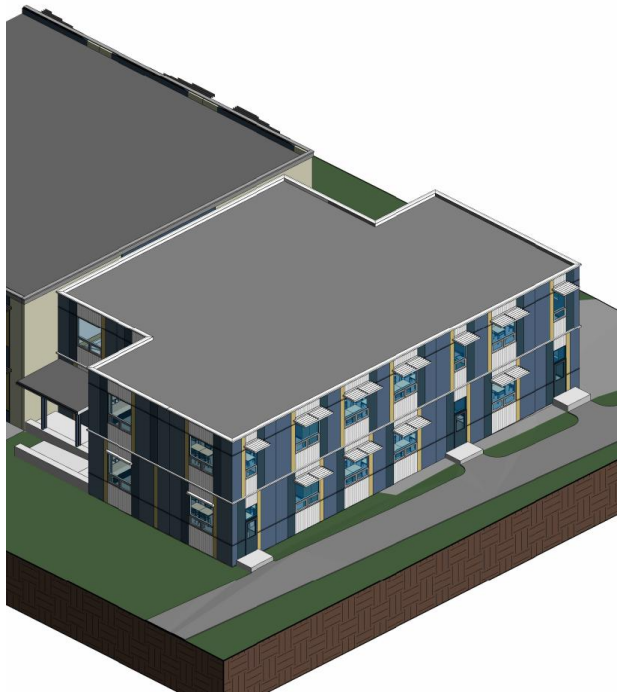
# Final Design

- Design has been refined to meet the client's vision and requirements.



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# Colour & Material Choices

- Takes inspiration from Lynn Fripps Elementary crest

- Seamlessly blend new addition into existing school environment

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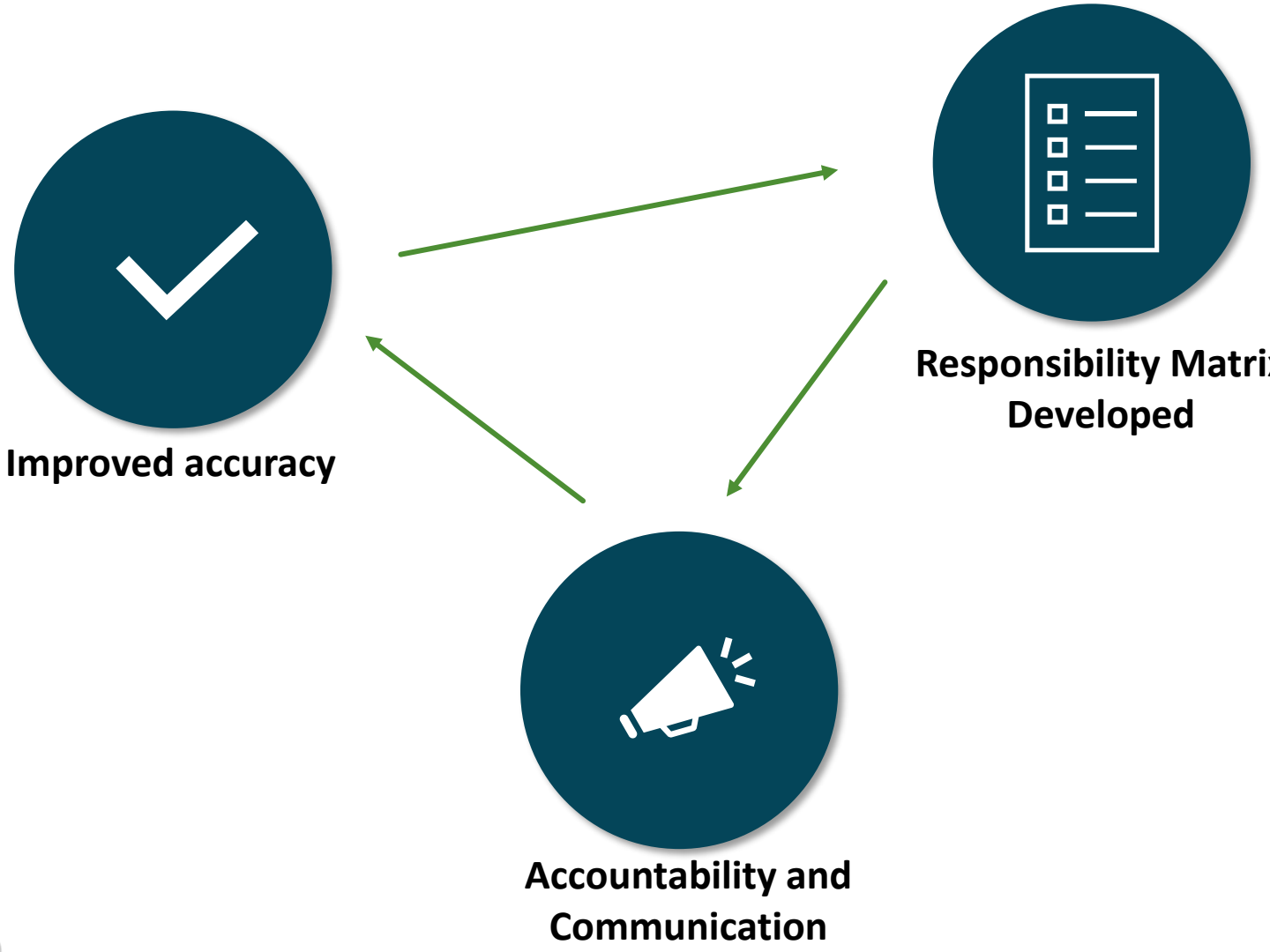
# Collaborative Framework



# Construction Management + Execution

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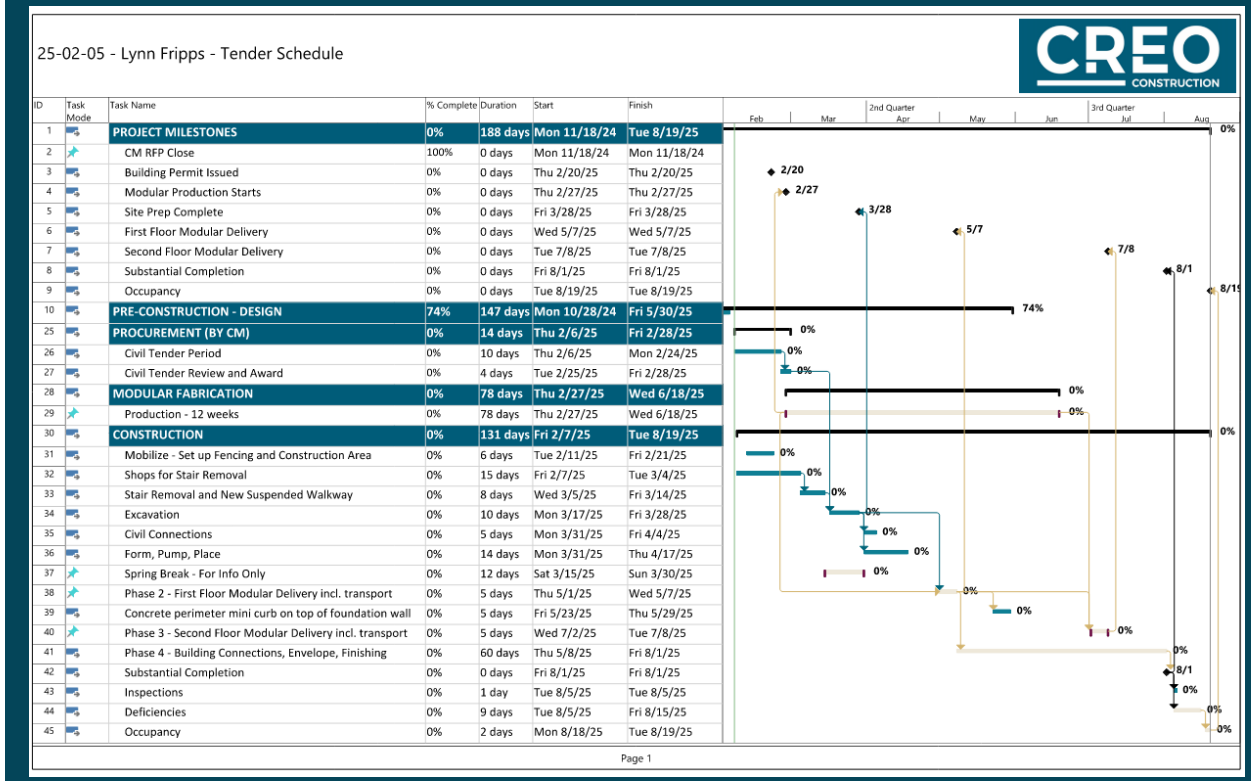
# Construction Management

## Project Startup

- Develop overall project schedule
- Prepare Procurement documents for the modular supplier
- Manage Submittal & RFI process
- Phased Tendering to award site works early



25-02-05 - Lynn Fripps - Tender Schedule

| ID | Task Mode | Task Name | % Complete | Duration | Start | Finish |
|---|---|---|---|---|---|---|
| 1 | | **PROJECT MILESTONES** | **0%** | **188 days** | **Mon 11/18/24** | **Tue 8/19/25** |
| 2 | | CM RFP Close | 100% | 0 days | Mon 11/18/24 | Mon 11/18/24 |
| 3 | | Building Permit Issued | 0% | 0 days | Thu 2/20/25 | Thu 2/20/25 |
| 4 | | Modular Production Starts | 0% | 0 days | Thu 2/27/25 | Thu 2/27/25 |
| 5 | | Site Prep Complete | 0% | 0 days | Fri 3/28/25 | Fri 3/28/25 |
| 6 | | First Floor Modular Delivery | 0% | 0 days | Wed 5/7/25 | Wed 5/7/25 |
| 7 | | Second Floor Modular Delivery | 0% | 0 days | Tue 7/8/25 | Tue 7/8/25 |
| 8 | | Substantial Completion | 0% | 0 days | Fri 8/1/25 | Fri 8/1/25 |
| 9 | | Occupancy | 0% | 0 days | Tue 8/19/25 | Tue 8/19/25 |
| 10 | | **PRE-CONSTRUCTION - DESIGN** | **74%** | **147 days** | **Mon 10/28/24** | **Fri 5/30/25** |
| 25 | | **PROCUREMENT (BY CM)** | **0%** | **14 days** | **Thu 2/6/25** | **Fri 2/28/25** |
| 26 | | Civil Tender Period | 0% | 10 days | Thu 2/6/25 | Mon 2/24/25 |
| 27 | | Civil Tender Review and Award | 0% | 4 days | Tue 2/25/25 | Fri 2/28/25 |
| 28 | | **MODULAR FABRICATION** | **0%** | **78 days** | **Thu 2/27/25** | **Wed 6/18/25** |
| 29 | | Production - 12 weeks | 0% | 78 days | Thu 2/27/25 | Wed 6/18/25 |
| 30 | | **CONSTRUCTION** | **0%** | **131 days** | **Fri 2/7/25** | **Tue 8/19/25** |
| 31 | | Mobilize - Set up Fencing and Construction Area | 0% | 6 days | Tue 2/11/25 | Fri 2/21/25 |
| 32 | | Shops for Stair Removal | 0% | 15 days | Fri 2/7/25 | Tue 3/4/25 |
| 33 | | Stair Removal and New Suspended Walkway | 0% | 8 days | Wed 3/5/25 | Fri 3/14/25 |
| 34 | | Excavation | 0% | 10 days | Mon 3/17/25 | Fri 3/28/25 |
| 35 | | Civil Connections | 0% | 5 days | Mon 3/31/25 | Fri 4/4/25 |
| 36 | | Form, Pump, Place | 0% | 14 days | Mon 3/31/25 | Thu 4/17/25 |
| 37 | | Spring Break - For Info Only | 0% | 12 days | Sat 3/15/25 | Sun 3/30/25 |
| 38 | | Phase 2 - First Floor Modular Delivery incl. transport | 0% | 5 days | Thu 5/1/25 | Wed 5/7/25 |
| 39 | | Concrete perimeter mini curb on top of foundation wall | 0% | 5 days | Fri 5/23/25 | Thu 5/29/25 |
| 40 | | Phase 3 - Second Floor Modular Delivery incl. transport | 0% | 5 days | Wed 7/2/25 | Tue 7/8/25 |
| 41 | | Phase 4 - Building Connections, Envelope, Finishing | 0% | 60 days | Thu 5/8/25 | Fri 8/1/25 |
| 42 | | Substantial Completion | 0% | 0 days | Fri 8/1/25 | Fri 8/1/25 |
| 43 | | Inspections | 0% | 1 day | Tue 8/5/25 | Tue 8/5/25 |
| 44 | | Deficiencies | 0% | 9 days | Tue 8/5/25 | Fri 8/15/25 |
| 45 | | Occupancy | 0% | 2 days | Mon 8/18/25 | Tue 8/19/25 |



Page 1

**School District**

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**Subconsultants**

**Modular Supplier**

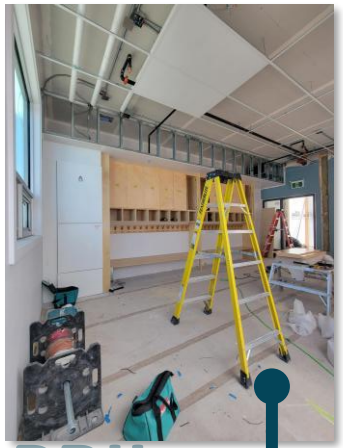
**Subtrades**

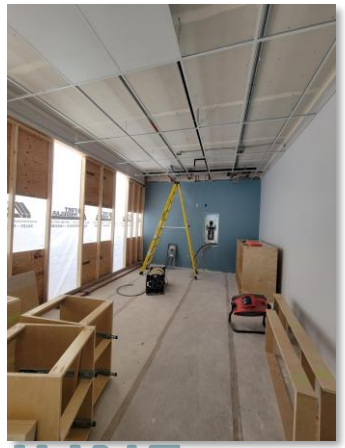
# Construction Management

## Concurrent Delivery

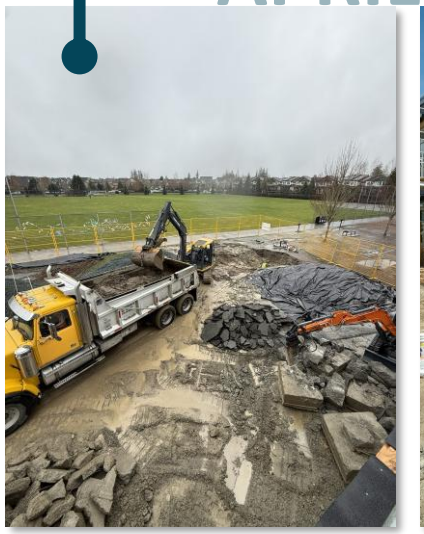
**Modules are fabricated off-site.**

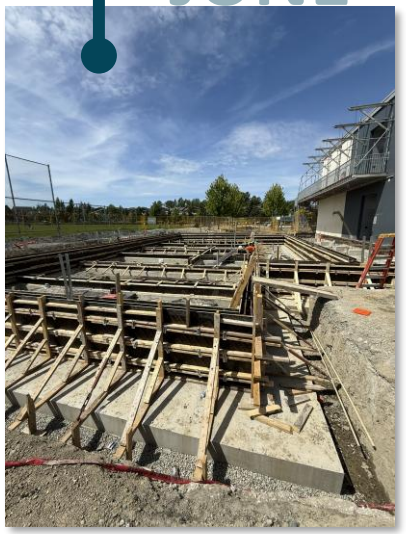




MARCH APRIL MAY JUNE

**Site preparation, foundations & services are installed.**

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# Construction Management

## Concurrent Delivery

- The overlap of site works and off-site modular fabricated cut the overall on-site schedule by roughly **45%** - which is crucial when working within limited unoccupied timeframes on site.


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# Construction Management

## Installation

- Modules are driven on a flatbed truck from the factory directly to site.
- All routes, unit sizes, underpasses, and turning radiuses are taken into careful consideration when planning for transportation to site.


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# Construction Management

## Installation

- Modules are then craned onto the foundation one unit at a time.  This whole process took only **2 days** to complete.

- Modules can be installed one storey at a time, or concurrently.

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# Construction Management

## Installation

- Once the modular units are in place, structural connections are completed, followed by systems connections (electrical, sprinkler, mechanical, etc.)

- Exterior envelope and final interior & exterior finishes are then completed.

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# Construction Management

## Installation

- Once the modular units are in place, structural connections are completed, followed by systems connections (electrical, sprinkler, mechanical, etc.)

- Exterior envelope and final interior & exterior finishes are then completed.

Interior connection points are finished.

Roofing is installed across all modules.

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# Construction Management

## Installation

- Once the modular units are in place, structural connections are completed, followed by systems connections (electrical, sprinkler, mechanical, etc.)

- Exterior envelope and final interior & exterior finishes are then completed.

Final 20% of interior finishes are installed.

Exterior concrete pads, steps and sidewalks are poured.

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# Construction Management

## Installation

- Once the modular units are in place, structural connections are completed, followed by systems connections (electrical, sprinkler, mechanical, etc.)

- Exterior envelope and final interior & exterior finishes are then completed.

Finished classroom!

Finished washroom group!

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# Construction Management

## Installation

- Once the modular units are in place, structural connections are completed, followed by systems connections (electrical, sprinkler, mechanical, etc.)

- Exterior envelope and final interior & exterior finishes are then completed.

Finished exterior cladding.

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# Timelapse Video

# Modular Construction

## Key Outcomes & Benefits

- **Lynn Fripps:** from concept to occupancy in 12 months.
- Off-site fabrication and concurrent site work reduced the schedule significantly. Modules arriving water-tight with finishes also reduces on site time.

1.

**SPEED & EFFICIENCY**

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# Modular Construction
## Key Outcomes & Benefits

- Early collaboration and phased tendering improved budget certainty and reduced change orders.
- Factory-built consistency minimized weather delays and rework.

**2.**

**COST CONTROL & PREDICTABILITY**

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# Modular Construction
## Key Outcomes & Benefits

- Precision manufacturing ensured consistent quality.
- Off-site production reduced waste (controlled environment)
- All plastics and cardboard from materials used on site were recycled by Creo

3.

**QUALITY & SUSTAINABILITY**

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# Modular Construction
## Key Outcomes & Benefits

- Teachers praised the natural light and acoustics
- Minimal disruption to on-site operations
- Post-occupancy survey results

4.

**STAKEHOLDER SATISFACTION**

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# Panel Discussion

# Panel Discussion

1. The Lynn Fripps project was completed in a year - what strategies or decisions made that schedule achievable?

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# Panel Discussion

**2.** What obstacles came up during design or construction and how were they solved?

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# Panel Discussion

3. Can you speak to how sustainability was incorporated into this project?

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# Panel Discussion

**4.** What should school districts expect in terms of cost when choosing modular versus a conventional stick-build approach?

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# Panel Discussion

**5.** What kind of feedback did you receive from staff, students, and facilities teams after occupancy?

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# User Feedback

**Question:** What improvements have you noticed since the opening of the new building?

Lynn Fripps Principal: ***“ Versus the portables that we used to have, there is more natural light […] and more accessible spaces for the students and staff”.***



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# User Feedback

**Question:** How does the new space better support the daily needs of students and staff compared to before?

Lynn Fripps Principal: ***" It has allowed for more flexibility in the learning environment. […] the additional workrooms, offices, and study space have allowed for more small group learning opportunities - it's connected to the school versus being outside and away from everything"***



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# User Feedback

**Question:** What aspect of the overall project has been the most impactful on the school community?

Lynn Fripps Principal: ***“Willoughby is a growing community […] this additional space will meet the current and future needs of our community”***

***“This beautiful addition will continue to support the children for a long time in this community. We’re very thankful”.***



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# Panel Discussion

**6.** If you could give one piece of advice to other school districts considering modular, what would it be?

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# Panel Discussion

**7.** How does modular construction perform over time compared to conventional site-built methods?

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Thank you!
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